

## Odonata records from southwestern Saudi Arabia

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**Abstract.** Results are presented of a one-week field trip in November 2012 to southwest Saudi Arabia. Nineteen dragonfly species were collected, observed and photographed at 17 localities in the regions of Makkah, Bahah, 'Asir, and Jizan. A new record of the little known *Trithemis dejouxi* is documented. *Lestes pallidus*, which had not been recorded for decades, is confirmed and new for Jizan. *Anax imperator* and *A. parthenope*, rarely mentioned in literature, were recorded at several localities.

Further key words. Dragonflies, damselflies, Anisoptera, Zygoptera

### Introduction

During the last 35 years the Odonata fauna of the Arabian Peninsula (incl. Socotra, Bahrain, Kuwait, and Qatar in addition to Oman and Yemen) has been studied fairly well. However, Saudi Arabia is less well known with only few publications available (WATERSTON 1980, 1985; SCHNEIDER & KRUPP 1993; LAMBRET & BOUDOT 2009). Saudi Arabia is a large country (2 149 690 km<sup>2</sup>) mostly covered by desert. Its geographical location places it at a crossroads between the Levant in the North, where West Palaearctic species have their range limits, mainland Asia in the Northeast with potential species of Oriental and Central Asian origin, and Africa in the Southwest near the Red Sea, where the 'Asir Mountains, the Yemen, and the Dhofar harbour Afrotropical species. Thus new records can certainly still be expected.

### Material and methods

The records presented were made during a trip conducted by HD from 08-xi- to 14--xi-2012. Localities visited in the 'Asir Mountain range are located in the regions of Makkah, Bahah, 'Asir and Jizan and all regions are included within the 'Asir region sensu WATERSTON & PITTAWAY (1991). Specimens have been deposited in the collection of the first author in Neuchâtel (Switzerland), singletons in the King Saud University Museum of Arthropods, Riyadh, Saudi Arabia (KSMA), and the collection of Stefan Ober in München (Germany). For determination of imagines DIJKSTRA & CLAUSNITZER (2014) and SUHLING & MARTENS (2007) were used.

### List of collecting sites

(1) Wadi Buwa, Makkah (20°44'59.4"N, 41°14'49.7"E, 1 360 m a.s.l.), 08-xi-2012. Slowly flowing and standing water used by cattle, either without vegetation

or with short grassy vegetation, banks with sand and rocky outcrops. (2) Wadi Elarj, near Adam, Makkah (20°31'13.3"N, 40°46'53.3"E, 530 m a.s.l.), 09-xi-2012. Mostly standing water and short, grassy vegetation on the bank, *Tamarix* present. Survey after 16:00 (GMT), covered sky, reduced activity. (3) Wadi Elarj, near Adam, Makkah (20°27'10.6"N, 40°48'56.0"E, 440 m a.s.l.), 09-xi-2012. Mostly standing water and muddy spots with *Typha*, a trickle of flowing water with short grassy vegetation and bodies of water in their pioneer stages. (4) Wadi Buwa, Bahah (20°43'56.8"N, 41°16'39.4"E, 1 345 m a.s.l.), 08-xi-2012. Slowly flowing and standing water, either without vegetation or with short grassy vegetation, gravel and sand actively extracted from the river bed. (5) Wadi Khat, 'Asir, (19°05'21.1"N, 41°58'15.9"E, 500 m a.s.l.), 10-xi-2012. Trickle of flowing water on sand, mud present, waterfall with pool. (6) Wadi Talalea, 'Asir (19°00'09.9"N, 41°43'55.3"E, 210 m a.s.l.), 10-xi-2012. Pond dug in sand (175 m<sup>2</sup>) vegetation belt with *Typha* sp., *Prosopis* sp. on the banks. (7) Wadi Talalea, 'Asir (19°00'06.4"N, 41°43'53.7"E, 210 m a.s.l.), 10-xi-2012. Large wadi in open landscape with flowing water, banks mostly in pioneer stages, locally grassy vegetation on mud, bushes present (*Prosopis* sp., *Calotropis* sp., *Leptadenia* sp.). (8) Wadi Baqrah, 'Asir (18°47'31.7"N, 42°01'06.5"E, 420 m a.s.l.), 10-xi-2012. Standing and slowly flowing water in the river bed with grass. Survey after 16:00 (GMT), reduced activity. (9) Wadi Aziza, 'Asir (18°13'12.1"N, 42°25'54.5"E, 2 520 m a.s.l.), 14-xi-2012. Small valleys with aquatic vegetation, but no free water. (10) Wadi Shahadan, Jizan (17°28'36.0"N, 42°51'25.4"E, 460 m a.s.l.), 13-xi-2012. Wadi with flowing water, waterfall, wadi in its pioneer stage, gravel and rock on the banks. (11) Wadi Shahadan, Jizan (17°27'07.0"N, 42°42'49.7"E, 190 m a.s.l.), 13-xi-2012. Flat wadi bed with shallow water, wadi in its pioneer stage with stones. Survey after 16:00 (GMT), reduced activity. (12) Wadi Dafa, Eiban, Jizan (17°22'31.6"N, 43°04'30.7"E, 885 m a.s.l.), 12-xi-2012. Wadi with flowing water and standing shallow water bodies, eutrophication apparent. (13) Wadi Al Gourah, Jizan (17°17'39.2"N, 43°04'09.2"E, 460 m a.s.l.), 12-xi-2012. Wadi in its pioneer stage with flowing water, *Bacopa monnieri*, *Fimbristylis* sp., grasses. (14) Wadi Qusei, Jizan (17°15'16.0"N, 42°57'59.5"E, 255 m a.s.l.), 12-xi-2012. Large wadi with flowing water. Survey after 16:00 (GMT), reduced activity. (15) Wadi Damad, Jizan (17°12'21.2"N, 43°01'34.9"E, 260 m a.s.l.), 11-xi-2012. Large wadi in its pioneer stage with flowing water, certain places with faster current. (16) Wadi Ajk, Feifa, Jizan (17°07'58.6"N, 43°02'37.1"E, 235 m a.s.l.), 11-xi-2012. Dry wadi bed except for small bodies of standing water with gravel, small *Acacia* sp. and grass on the banks. (17) Wadi Jizan, Jizan (17°01'20.9"N, 42°56'44.6"E, 120 m a.s.l.), 11-xi-2012. Downstream from Wadi Jizan Dam, mostly dry stony and muddy water bed, little pools and some areas of the bank with developed vegetation of *Cyperus* sp..

## Results

In total, 19 species were recorded at 17 collecting sites. Except for two photographically documented species all taxa were authenticated by voucher specimens (62). The finding of *Lestes pallidus* was the second for the country and *Trithemis dejouxi* is a generally poorly known species.

### List of recorded species

#### Family Lestidae

##### 1. *Lestes pallidus* Rambur, 1842

(16) 3♂.

#### Family Coenagrionidae

##### 2. *Ceriagrion glabrum* (Burmeister, 1839)

(3) 1♂ 1♀ in tandem linkage (17) 1♂ 1♀ in tandem linkage.

##### 3. *Ischnura evansi* Morton, 1919

(1) 100♂ 100♀ (2) 2♂ 2 teneral (3) 100♂ 100♀ (4) 2♂ 2♀ (6) 1♂ (8) 2♂ 2♀ (12) 3♂ (14) 1♂ (17) 2♂ 2♀.

##### 4. *Pseudagrion hamoni* Fraser, 1955

(1) 3♂ (2) 4♂ (3) 20♂ 1♀, in copulae, teneral (4) 2♂ (6) 2♂ 1♀, teneral (12) 1♂ (13) 1♂ (15) 1♂.

#### Family Aeshnidae

##### 5. *Anax ephippiger* (Burmeister, 1839)

(2) 1♂ (3) 11♂ 1♀, in copulae, teneral (7) 1♂ (8) 1♂ (16) 2♂ (17) 2♂ 1♀, in tandem linkage.

##### 6. *Anax imperator* (Leach, 1815)

(3) 3♂ (4) 1♂ 1♀ ovipositing (6) 1♂ (12) 2♂.

##### 7. *Anax parthenope* Selys, 1839

(4) 1♂.

#### Family Gomphidae

##### 8. *Paragomphus genei* (Selys, 1841)

(3) 1♂ (4) 1♂ (5) 1♂ (7) 2♂ 1♀, in copulae (10) 2♂ (12) 2♂ (13) 1♂ (15) 1♂ 1♀.

#### Family Libellulidae

##### 9. *Brachythemis impartita* (Karsch, 1890)

(17) 1 000♂ 100♀, 10 immature.

##### 10. *Crocothemis erythraea* (Brullé, 1832)

(2) 1♂ 1♀ (3) 1♂ (4) 20♂, 1 teneral (6) 11♂ (12) 20♂, 1♀, ov (13) 6♂, 1♀, ovipositing (16) 2♂ (17) 11♂.

11. *Orthetrum chryso stigma* (Burmeister, 1839)  
(1) 1♂, 2 teneral (2) 1♂ (2) 5♂ 1♀ (3) 20♂ (4) 6♂ (5) 2♂ (7) 6♂ 1♀, in copulae (8) 2♂ (11) 20♂ (12) 6♂ (13) 20♂ 2♀, ovipositing (15) 6♂, 1♀, (17) 1 immature.
12. *Orthetrum brevistylum* Kirby, 1896  
(5) 11♂ (12) 6♂.
13. *Orthetrum sabina* (Drury, 1773)  
(3) 6♂ 1♀, in copulae (5) 1♂ (6) 10♂ (7) 1♂ (13) 1♂ (16) 5♂ 1♀, ovipositing (17) 10♂, 1♀, in copulae.
14. *Pantala flavescens* (Fabricius, 1798)  
(3) 6♂ (4) 1♂ (5) 3♂ (7) 1♂ (10) 1♂ (11) 1 adult (12) 1♂ (13) 3♂ 1♀, in copulae (15) 6♂ (16) 5♂ (17) 6♂.
15. *Trithemis annulata* (Beauvais, 1807)  
(2) 2♂ (3) 20♂ 10♀ (6) 2♂ (7) 2♂ (15) 6♂ 1♀ (17) 2♂.
16. *Trithemis arteriosa* (Burmeister, 1839)  
(1) 1♂ (2) 1♂ (3) 1♂ 1♀ (4) 1♂ (5) 6♂ 3♀ (10) 20♂ (12) 50♂ (17) 1♀.
17. *Trithemis dejouxi* Pinhey, 1978  
(10) 1♂.
18. *Trithemis kirbyi* Selys, 1891  
(1) 1 teneral (2) 50♂ 10♀ (3) 20♂ (4) 2♂ (5) 6♂ (7) 6♂ (8) 1♂ 1♀ (9) 1♂ (11) 100♂ 1♀, ovipositing (12) 6♂ (13) 20♂ (14) 1♂ (15) 50♂ 1♀, in copulae (16) 3♂.
19. *Zygonyx torridus* (Kirby, 1889)  
(15) 11♂ 1♀.

## Discussion

The present study significantly improves our knowledge of the odonate fauna of Saudi Arabia and particularly the 'Asir Mountains. The area is like the mountains of western Yemen, Hadhramout and Dhofar one of the best diversity hotspots of Arabia (SCHNEIDER & NASHER 2013). However, new species can still be expected, especially at the country level. On a regional scale, much work has yet to be done to clarify the distribution of species, especially for the purposes of conservation. Little information is available and the larval stages of numerous species remain unknown.

Currently, 65 species are known from the Arabian Peninsula, amongst which *Ischnura nursei* for United Arab Emirates (FEULNER & JUDAS 2013) and *Tholymis tillarga* for Oman were the most recent new records (BALL 2014). In Saudi Arabia, 42 species have been recorded so far, with *Trithemis dejouxi* being the most recent addition. 42 are known from mainland Yemen, 45 from Oman, and 31 from the United Arab Emirates.

*Lestes pallidus* was first mentioned for Arabia by WATERSTON (1985) based on material collected in Yemen (1962) and Saudi Arabia in Hedjaz (1983). Our data

represent the second Saudi Arabian record and the first for Jizan region. Three males were found at a small pool with gravel substrate and no vegetation in a dry wadi bed. They perched on *Acacia* sp., on new growth overhanging the pool, and also on a nearby tree in the shade. This behaviour fits the seasonal ecology of the species described from Africa (SUHLING & MARTENS 2007; KIPPING 2010).

*Pseudagrion hamoni* is typical for wadis with flowing water and was found in most visited localities.

The time of year was typical for reproductive activity of *Anax ephippiger* corresponding to the beginning of the rain season.

Data on *Anax imperator* are scarce in literature (WATERSTON 1980, 1985; SCHNEIDER & KRUPP 1993). The species is rather difficult to catch and thus probably underestimated in species counts. Most of our records refer to observations in the field, as the species is easily identified with binoculars.

Although *Anax parthenope* is expected to be common in Arabia, only few records are available (WATERSTON 1980, 1985). Our male was flying over a pioneer basin in the wadi originating from gravel extractions.

*Paragomphus genei* was found in most localities with flowing water visited. A mating pair was found perching on a perennial bush *Leptadenia pyrotechnica*, some 20 meters away from the wadi.

*Brachythemis impartita* was previously recorded in Arabia by WATERSTON (1980, 1985) sub *B. leucosticta*. Our observations confirm the presence of *B. impartita*, as cited by DIJKSTRA & MATUSHKINA (2009). This species was particularly abundant, with many thousands of individuals at seasonally dry sections of the wadi.

*Orthetrum taeniolatum* was recorded from Arabia by WATERSTON (1980, 1985). According to both DUMONT & VERSCHUREN (2005) and CLAUSNITZER & DIJKSTRA (2005), an *Orthetrum* species previously identified as *O. taeniolatum* Schneider, 1845 in Africa and southwestern Arabia was in fact *O. kollmannspergeri* Buchholz, 1959, which is actually considered a junior synonym of *O. brevistylum* (DIJKSTRA & CLAUSNITZER 2014). We report two additional localities for *O. brevistylum* from 'Asir and Jizan. The species was found at pioneer sites without vegetation, the males sitting on sandy ground near flowing water.

*Trithemis dejouxi* was first recorded for the Arabian Peninsula in Yemen as *Trithemis donaldsoni* by DUMONT & AL-SAFADI (1991) and subsequently as *Trithemis* aff. *donaldsoni* by KRUPP et al. (2006). Initially described by PINHEY (1978) as a subspecies of *T. donaldsoni* based on structural characters, *T. dejouxi* was later raised to specific rank by O'NEIL & PAULSON (2001). This proposal was followed by DIJKSTRA (2007) and DAMM et al. (2010). This species was found in Saudi Arabia in 2010 for the first time (cf. BOUDOT et al. 2013; SCHNEIDER & SAMRAOUI 2015.) and the knowledge about distribution and ecology seems to be generally limited in this species. Our male was seen sitting on a rock on the bank of the river near water (Figs 1, 2). The wadi was in a pioneer stage following recent rains, one or two weeks before.



**Fig. 1.** *Trithemis dejouxi* male. Wadi Shahadan, Jizan, Saudi Arabia (13-xi-2012). Photo: CM



**Fig. 2.** Habitat of *Trithemis dejouxi*. Wadi Shahadan, Jizan, Saudi Arabia (13-xi-2012). Photo: CM



**Fig. 3.** *Trithemis dejouxi* male specimen in lateral view collected at Wadi Shahadan, Jizan, Saudi Arabia (13-xi-2012). Photo: Thierry Bohnenstengel

Species present in the same area as *T. dejouxi* included *T. arteriosa* and *Zygonyx torridus*. With *T. furva* another member of the genus developing dark pruinescence with age occurs in Saudi Arabia and Yemen. Compared with *T. dejouxi*, males of this species are stouter and show a clearly broader abdomen than males of the slender *T. dejouxi* (Figs 1, 3). The male specimen collected (Fig. 3) was identified under the microscope by the shape of the hamule and wing pattern (DIJKSTRA & CLAUSNITZER (2014).

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